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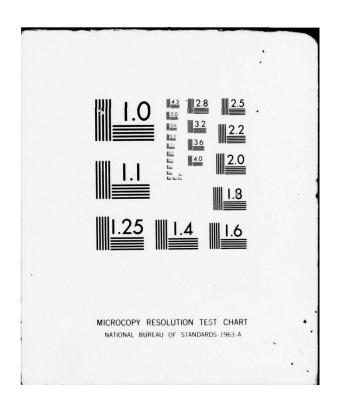
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10 June 1976

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Changes 2 and 3.

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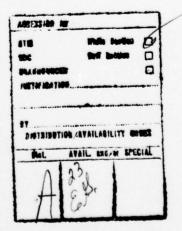
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COMMAND AND CONTROL TECHNICAL CENTER

Computer System Manual Number CSM UM 15-74

10 June 1976

NMCS INFORMATION PROCESSING SYSTEM
360 FCRMATTED FILE SYSTEM (NIPS 360 FFS)

Users Manual

Volume VII - Utility Support (UT)

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ABSTRACT

This volume defines the capabilities of NIPS 360 FFS Utility (UT) components. It describes the function of each utility, its inputs, its outputs, and serves as a reference for the knowledgeable user of these components.

This document supersedes CSM UM 15B-68, Volume VII.

CSM UM 15-74 Volume VII, is part of the following additional NIPS 360 FFS documentation:

CSM UM 15-74	Vol. I Vol. II	Introduction to File ConceptsFile Structuring (FS)
	Vol. III	- File Maintenance (FM)
	Vol. IV	- Retrieval and Sort Processor (RASP)
	Vol. V	- Output Processor (OP)
	Vol. VI	- Terminal Processing (TP)
	Vol. VIII	- Joh Preparation Manual
	Vol. IX	- Error Codes
TR 54-74		- Installation of NIPS 360 FFS
CSM GD 15-74		- General Description

For example, the following table value statements would supply argument/function pairs to a "Service Table":

E U.S. Coast Guard
W U.S. Army
J U.S. Air Force
N U.S. Navy
M U.S. Marine Corps

The order of argument/function pairs in the example shown remains consistent in each table value statement. However, column selection of data value placement is free format. In this format the fixed length field cannot contain embedded blanks, but the variable length field can.

2.2 Job Setup

a. The following job setup is used to execute the XTABGEN cataloged procedures and must be organized in the order shown:

//Jobname JOB (Standard parameters)
//Stepname EXEC XTABGEN, LIB=yourlib
//TAB.SYSIN DD *
TABLE IDENTIFICATION STATEMENT (Required)
HEADR STATEMENT (Optional)
CCMMENT STATEMENT (Optional)
TABLE VALUE STATEMENTS (Required)
/*

- b. More than one table may be generated in a single job step. If tables are batched and a table argument length exceeds 30 bytes, TABGEN must be informed by stating the maximum argument length in the FARM field of the EXEC card, for example, PARM=nnn (nnn is any number between 1 and 255).
- c. The generated table will become an executable load module which will reside as a member of a library that will be identified by the LIB= parameter in the EXEC card. The user may create his own new

library by overriding the following symbolic parameters:

LIBDISP = (NEW, KEEP)
VLIB = (volume)
LIBSP = (space)
ULIB = (unit)

2.3 Limitations

- # a. The maximum table size is approximately 528,000 bytes. The maximum number of pages which any table may contain is 132.
 - b. The maximum argument/function size is:
 - o. 256 bytes when using keyword table identification statements
 - 80 bytes when using fixed table identification statements.

2.4 Examples

Examples of test runs using keyword table identification statements.

a. The following TABGEN source deck setup was used to generate a fixed-to-variable length table using free format table value statements. The table name is CTRYS, and the table converts a two-character internal storage code to an output value with a maximum length of 15 characters. The user name is TABGENTEST and the table page size is 2,000 characters.

//Johname JOB (standard parameters)
//STEPA EXEC XTABGEN, LIB=yourlib
//TAB. SYSIN DD *
TABLE=CTRYS ARG=2 FUNC=15 USE=0 PAGE=2K TABGENTEST
* TABLE CTRYS USING FREE FORMAT TABLE

** IDENTIFICATION CARD AND TABLE VALUE *** CARDS. AA AFRICA ATLANTIC OCEAN AC 64

CARIEEFAN

65 PACIFIC ISLANDS

/*

The output listings for this source deck will will as follows:

DATE 71001 TABLE-CTRYS ORIGINATOR TABGENTEST PAGE-001

TABLE CTRYS USING FREE FORMAT TABLE IDENTIFICATION CARD AND TABLE VALUE CARDS.

65	PACIFIC ISLANDS
€4	CARIBBEAN
AC	ATLANTIC OCEAN
AA	AFRICA
ARGUMENT	FUNCTION

The following TABGEN source deck setup was used to b. generate a variable-to-fixed length conversion table using fixed format table value statements. The table name is UNLVSI, and the table is used to convert an external value with a maximum length of 15 characters to an input storage code with a maximum length of three characters. The user name is TABGENTEST and the table page size is 1,000 bytes:

```
JOB (standard parameters)
//Jobname
                EXEC XTABGEN, LIB = yourlib
//STEPA
//TAB.SYSIN
                DD *
TABLE=UNLVSI ARG=10/24 FUNC=1/3 USE=I TABGENTEST
      TABLE UNLYS USING REYWORD TABLE IDENTIFICATION
      STATEMENTS AND FIXED FORMAT TABLE VALUE
***
     CARDS.
```

A NUMBERED ARMY

ACD ACADEMY

U UNIT
USS US SHIP
WG WING
/*

The output listing for this source deck will appear as follows:

DATE 71007 TABLE-UNLVSI ORIGINATOR-TABGENIEST PAGE-001

TABLE UNLYS USING KEYWORD TABLE IDENTIFICATION STATEMENT AND FIXED FORMAT TABLE VALUE CARDS.

ARGUMENT FUNCTION

NUMBERED ARMY A
ACADEMY ACD

UNIT UUS SHIP USS

Table 1 - Name of Stop Word Table (optional)

Table 2 - Name of Dictionary (optional)

Sub 1 - Name of User Scan Routine (optional)

TEXT Hyphen Option
Default is TEXT

DROP RETAIN SEPARATE

TEXT - Always retain as part of text value.

DROP - Always drop from value. Superfluous if (1) text characters immediately precede and follow hyphen or (2) immediately preceded by a text character and followed by one or more blanks and a text character. If neither of these cases apply, hyphen is treated as a word separator.

RETAIN - Same rules that apply to DROP, except that when the hyphen is not a word separator it is kept in the value as a text character.

SEPARATE - Hyphen is always treated as a word separator.

The delete operation requires only the first three operands - IN CEX, the field name, and the action keyword, CELETE. For a secondary indexed field, the add operation requires only the first two operands -- INDEX and the field name -- but may optionally provide for a conversion and/or analyzer subroutine or table. In this case, the action parameter ADD must be present.

If only one subroutine or table is designated, its function - as a conversion subroutine or as an analyzer subroutine - will be determined from the parameters that are

specified in the SUB/TAB statement defining the subroutine. If both parameters are present, the first must be the conversion subroutine, and the second must be the analyzer subroutine. An analyzer subroutine or table may not be used as a conversion routine, and a conversion subroutine or table may not be used as an analyzer subroutine in the same Index Specification run.

For a keyword indexed field, the action parameter KEYWORD must be present after the ADD parameter in order to differentiate the two types of indexed fields. Any combination of stop word table, dictionary scan routine or hyphen option may be specified in any order.

Example of an Add Index Action:

INDEX MEQ PT ADD CONSUE

Example of a Delete Index Action:

INDEX CNTRY DELETE

11.2 UTNDXSPC Output

UTNDXSPC builds and inserts Index Descriptor Records into the data file for indexes added and deletes Index Descriptor Records for indexes deleted. It then calls Index Maintenance to either generate or update the Index Data Set. UTNDXSPC also lists a summary of actions performed plus any error conditions encountered.

11.3 UTNDXSPC Job Setup

The following JCL cards are used to invoke the cataloged procedure XSP which will either generate or update a diskresident Index Data Set based on the ISAM or SAM data file.

//JOBNAME JCE (Standard Parameters)

*//STEPNAME EXEC XSP, PARM=GEN, ISAM=filename,

VISAM='SER=xxxxxx',

XVOL='SER=yyyyyy',

// // /*	YDISF=(aaaa), BLKSIZ E= zzzz, NBRBLK=nnn, XINDEX=indxname, LAB=bb,DEN=c,VSMOUT= *SER=dddddd*,SAMOUT=samname
where:	
#PAR M=GEN -	Required only when creating an Index Data Set from a file already containing Index Descriptor records in the FFT.
filename -	Name of ISAM or SAM data file.
xxxxxx -	Volume serial number of the disk-resident ISAM data file or tape-resident SAM data file.
уууууу -	Volume serial number of the disk-resident Index Data Set
aaaa -	Required only when generating a new Index Data Set
zzzz -	Blocksize, needed only when generating a new Index Data Set and overriding the default size. Blocksize must be between 560 and 1020 bytes.
nnn -	Number of blocks, needed only when generating a new Index Data Set and overriding the default size. A minimum of 50 blocks must be allocated.
indxname -	Name of Index Data Set. It must be the same as the SAM or ISAM operand. The name will be suffixed with an X by the procedure.

The following parameters are required only when processing a SAM data base:

bb - Label processing

Tape processing

dddddd - Volume serial number of the output SAM data

file

samname - Name of output SAM data file. (Cmitted if

same as input file.)

#Section 16

Format Definition Translator Utility (UTODE)

UTODE is used to place format definitions on a user library. A format definition gives a description of a CRT display format and the Input Message Queue records to be created from data entered on the display. Before a user can call for the display format at a CRT terminal, the format definition must reside on the user library. UTODE creates skeleton and IMQ table control blocks from the format definition source statements and writes the control blocks into the user library using the display format name as the member name.

16.1 Input

Input to UTODE will consist of one or more format definitions. The format definition source statements are described in Section 6 (FORMATTER) of the Terminal Processing Users Manual. The input source statements may be in punched cards or in card image records stored in a partitioned data set.

16.2 Job Setup

The following JCL statements illustrate the deck setup used to execute UTODE. In the first setup, the input definition source statements are in punched cards.

//AA EXEC XUTODE,LIB=TEST360,VLIB=SER=MYPACKS
//SYSIN DE *

Definition source statement cards.

/*

The following JCL would be used if the input were card image records stored in a library.

```
Utility Support (UT)
```

```
//AB EXEC XUTODE, LIB=TEST360, VLIB="SER=MYPACK"
//SYSIN DD DSN=MYLIB (FORMAT1), VOL=SER=MYPACK2,
DISP= (SHR, KEEP), UNIT=2314,
DCB= (RECFM=FM, LRECL=80, BLKSIZE=800)
/*
```



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Section 1

INTRODUCTION

This volume of the User Manual contains an analytical description of the general utility support functions provided by NIPS 36C FFS. These functions perform common processing required by all the components. The purpose, use, deck setup, and options of each capability are presented along with clarifying examples.

This volume is divided into the following sections:

- a. TABGEN Discusses the user conversion table generator function
- b. SUBIDR Discusses the user conversion subroutine lcader function
- c. Data Conversion Discusses the data base conversion function which converts a 1410 FFS data base to an equivalent NIFS 360 FFS data base
- # d. File Load/Unload Provides the Job Control Language to transfer files to and from the Sequential Access Method and the Indexed Sequential Access Method or the Virtual Storage Access Method.
 - e. UTQRTQDF Discusses the creation of a NIPS 360 FFS data file from the answer file (QRT/QDF) produced by the retrieval processor (RASP)
 - f. UTSUECHK Discusses the user subroutinε checkout function
 - g. UTDMPLIB Discusses the capability of printing the names of reports and/or logic statements currently residing on the data file

- h. UTCLASS Liscusses the capability of changing the classification of a data fale
- storage of source programs to facilitate housekeeping and program maintenance
- j. UTNEXSPC Discusses the manner in which indexing information may be used without running an FS or F1 job
 - the user to cransfer the entire data set, area one resident medium to the other
- 1. UTFLESCH Discusses the source statement field ceference scan function.

where

aaaaaaa = NIPS 360 FFS ISAM data base name on disk htbbbb = disk serial number for the ISAM data base cccc = 1410 FFS tape data base name dddddd = tape serial number for the 1410 data base eeeeeee = NIPS 360 FFS tape data base name ffffff = tape serial number for the 360 data base.

4.1.2 Procedure X1410CON

This procedure will convert a NIPS 360 FFS data base to a 1410 FFS data base. The NIPS 360 FFS data base is assumed to be on a 2314 disk pack and the converted data base is written on a seven-track tape with nonstandard labels. Using symbolic parameters for this procedure, one would use the following JCL:

```
//JOBNAME JCB (standard parameters)

// EXEC X141CCON,ISAM=aaaaaaa,VISAM='SER=bbbbbb', X

// SAM=eeeee,VSAM='SER=ffffff'

//SYSIN DD *
```

(1410 FFS FFT cbject deck)

/* where

aaaaaaa = NIPS 360 FFS ISAM data base name on disk bbbbbb = disk serial number for the ISAM data base eeeee = data base name for the 1410 FFS tape ffffff = tape serial number for the 1410 data base.

Section 5

FILE LCAC/UNLOAD UTILITIES

* The following paragraphs provide the pit contanguage and necessary information required to transfer files to and from the Sequential Access and Indexed Sequential Access Methods (SAM and ISAM) and to and from the Sequential Access and Virtual Storage Access Methods (SAM and VSAM). These utilities are effectively automatic and require only the JCL stream for control.

S.I SAM to ISAM or VSAM Dtility - UTBIDISM

This utility will build an NIPS ISAM data base or a NIPS VSAM data base from a NIPS SAM data base.

Also, under control of the CC PARM on the EXEC card it can optionally build the ISAM or VSAM data base in the compressed and/or compacted form or reverse the process to produce the ISAM or VSAM data base in the standard form

The JCL DD dards used are:

//DATAFILE DD Parameters defining the new ISAM data base

//SAMFILE DD Farameters defining the existing SAM data base

//VSMFILE DD Parameters defining the new VSAM data base.

The new ISAM NIPS data base will be created using the collection parameters: write check, master index, will dep

overflow, independent overflow, delete option and feedback reorganization criteria.

The procedure XSTCIS is used to build a NIPS 36C FFS ISAM or VSAM data base from a NIPS 360 FFS SAM data base. It is assumed that the existing NIPS SAM data base resides on a nine-track tape, and that the ISAM data base will reside on a 2314 disk pack with a disposition of KEEP. If output is to be a VSAM data base, it must have been previously defined via the VSAM service routine IDCAMS and cataloged on a NIPS user catalog. Using symbolic parameters for this procedure, one would use the following JCL:

```
//JOBNAME JCB (standard parameters)

// EXEC XSTOIS, IS AM=aaaaaaa, VISAM="SER=bbbbbbb", X

// PRIME=cc, INDEX=d, SAM=eeeeeeee, VSAM="SER=ffffff",

PARM="gggggg"

/*
```

where:

aaaaaaa = name used for the new ISAM data base

bbbbbb = disk serial number for the new ISAM data base cc = number of cylinders of prime space for the new ISAM data base

= size of index needed for the new ISAM data base

eeeeeeee = name of the existing SAM data base

ffffff = serial number of the tape that contains the

existing SAM data base.

gggggg = parameter option for data record transformation (COMPRESS, COMPACT, EXPAND or both COMPRESS and COMPACT separated by a comma) or, for SAM to VSAM, replace the ISAM parameter with:

VSCAT=aaaaaaaa, VSDSN=bbbbbbbbbbb, NON VSM='DUMMY,'

where:

aaaaaaaa = name of the NIPS user catalog bbbbbbbb = name of the VSAM data tase to be loaded.

Keywords in the FARM are used to designate the form of the output ISAM or VSAM data base irrespactive of the form of the input SAM data base. The keywords for the PARM and their implications are as follows:

COMPRESS - compression is applied to the output data records.

COMPACT - compaction is applied to the output data records

COMPRESS. - a combination of compression and compaction COMPACT is applied to the output data records

EXPAND - compression and/cr compaction is reversed to produce standard form data records.

#If none of the parameters is specified, no data transformation takes place, i.e., the output ISAM or VSAM data base form will be the same as the input SAM data base form.

Normally, after the file has been copied to disk, the remaining prime space will be filled with pad records. These are ISAM records with valid keys which have the delete oyte set on. These records make it possible to add records to the end of the file during later update and still remain in the prime area.

include the MOPAD keyword in the SAFM on the EXEC card.

An example might be a SAM file that is dumped to disk for use with TP. In this case, it would be desirable not to pass all of the pad records for a query, while the user is waiting at the terminal.

Upon completion of UTBLDISM, the user will receive either the message,

* 'NIPS ISAM (VSAM) DATA FILE HAS BEEN SUCCESSFULLY CREATED!

if the job was successful, or a USER 0200 ABEND if the job was unsuccessful.

#5.2 ISAM or VSAM to SAM Utility - UTBIDSAM

This utility will build a SAM data base from either an ISAM, a VSAM or another SAM data base. Under control of the PARM on the EXEC card, it can optionally build the output SAM data base in the compressed and/or compacted form. Also, prior to termination of the utility, it will print statistics that are beneficial for the user/analyst.

The first line of statistics printed gives the file name, volume serial number, date, time, and page number. Then information is printed concerning the sets.

5.3 Compression and Compaction of Data Records

Compression and compaction provide a means for the reduction of intermediate storage requirements for data without altering the integrity of the data. This data reduction scheme is particularly suited to data files that contain strings of identical characters or a large quantity of alphabetic data.

A string of identical characters is compressed by translating it to two bytes. The first byte is a control byte which indicates that compression has been applied and gives a count of the number of identical consecutive bytes that were in the original string. The second byte is identical to those in the original string.

A string of alphabetic characters is compacted by translating it to a control byte followed by a string of coded characters. The control byte indicates that compaction has been applied and gives a count of the coded characters. Each coded character represents a combination of two adjacent alphabetic characters.

There are seven columns of information displayed, with headings, as follows:

2 .	SET	The first entry is "FIXED SEL" and following
		is each periodic and if he the appropriated
		in the FFT.

- SIZE a variable field is specified, the minimum and (BYTF)
- C. MAXIMUM Shows the size, in bytes, of the largest subset subset within the specified set, fixed or periodic.

The section of the se

SIZE If a variable field is specified, the min-(BYTFS) imum and maximum size will not be the same.

- d. NUMBER OF These two columns reflect the minimum and SUBSETS maximum number of subsets within a periodic PER DATA for the total record. The fixed set would be RECORD 1 for minimum and maximum. The absolute minimum for periodics would be 8 and the MINIMUM maximum, any variable number.

 MAXIMUM
- e. TOTAL The total number of subsets in each periodic NUMBER set for the entire file is printed here.

 OF The number printed for the fixed set is the total number of data records in the file.
- f. SIZE OF This field shows the maximum size in bytes LARGEST of the indicated set for any record in the SET file.

For the ISAM file, the above-mentioned statistics are printed along with information on the organization of the ISAM file.

The number of PRIME, CVERFLOW, CELETE, and PAD records is calculated and printed. Also information from the ESCB is printed. The DSCB information concerns the INDEX, PRIME, and OVERFLOW cylinder/track allocation and usage. The column headings are "CYL/TRACKS ALLOCATED," "TRACKS UTILIZED," and "PERCENT TRACKS UTILIZED." The number of tracks in each cylinder overflow area is also provided. With this information the user can calculate the amount of space needed for his job. This alleviates unnecessary pad records that are added if any prime area remains.

The JCI DD cards used are:

//DATAFILE DD parameters defining existing ISAM data file
#//VSMFILE DD parameters define existing VSAM data file
//SAMFILE DD parameters defining existing SAM data file

//SANGUT DD parameters defining new SAM data file

The procedure XISTOS is used to build a NIPS 360 FFS SAN data file from an ISAM or VSAM data file or many a NIPS 360 SAN data file. It is assumed that the existing 75AN data file resides on a 2314 disk pack or that the existing SAM data file resides on a nine-track tape with standard label. If input is a VSAM data file, it must be cataloged on a NIPS user catalog. It is also assumed that the output SAM data file will be written on a standard label nine-track tare.

Using symbolic parameters for this procedure, one would use the following JCL:

//JOBNAME JOB(Standard parameters)

// EXEC XISTCS, ISAM=aaaaaa, VISAM="SER=thtbbh",
#// SAM=eeeees, VSAM="SER=ffffff", PARM=gggggg
/*

where:

asaaaa = name of the existing ISAM data file

btbbbb = serial number of the disk volume where the ISAM data file resides

seesee = name used for the new SAM data file

ffffff = serial number for the new SAM data file

qqqqqq = pirameter option for data record transformation
(COMPRESS, COMPACT, EXPAND or both COMPRESS and
COMPACT separated by a comma).

or:

//JOBNAME JCB (Standard parameters)

EXEC XISTCS, CLDS AM=aaaaaa, OLDVSAM=*SER=bltbbb*,

SAM=eeeeee, VSAM=*SER=ffffff*, PARM=gggggg

where:

aaaaaa = name of the existing SAM data file

thbbbb = serial number of the volume where the SAM

data file resides

eeeeee = name used for the new SAM data file

ffffff = serial number for the new SAM data file

gggggg = parameter option for data record transformation
 (COMPRESS, COMPACT, EXPAND or both COMPRESS and
 CCMPACT separated by a comma) or, for VSAM
 to SAM, replace the ISAM parameters with:

VSCAT=aaaaaaaa, VSDSN=bbbbbbbbb

where:

aaaaaaaa = name cf NIPS user catalcg bbbbbbbb = name cf exisitng VSAM data file.

* Keywords in the FARM are used to designate the form of the output SAM data base irrespective of the form of the input ISAM, SAM or VSAM data base. The keywords for the PARM and their implications are the same as those for the SAM to ISAM utility.

Upon successful completion of UTBLDSAM, the user will receive the message:

'NIPS SAM DATA FILE HAS BEEN SUCCESSFULLY CREATED'.

cards are required for each argument - use blank cards as filler if necessary).

7.3 Job Setup

The following statements illustrate the job setup used to execute the XSUBCHK procedure:

// EXEC XSUBCHK, LIB=TESTER
//SUBCHK.SYSIN DC *

(Control card defining input as described in 7.1)

data card(s)

The LIB symbolic parameter defines the partitioned data set where the subroutine's executable load module is stored. The library need not be a NIPS file library, but it should have the same DCB attributes.

Sample Control Card

MYSUB

C99

Sample data cards in the above case

Col 80 123456789CAOFTE6789ABCB 123796

7890567893BCBDEFGHQ

1379654321EDLC86789CFQC 569324

8432976843AFODETGHO

Section 8

HTDMPT.TF

The utility program UTDMPLIB allows the user/analyst to print the names of reports and/or logic statements associated with a NIPS 36C FFS data file. The output from this utility is a formatted listing. The input data file may be in Sequential Access Method (SAM) Indexed Sequential Access Method (ISAM) or Virtual Storage Access Method (ISAM) form.

8.1 Input

Input for the cataloged procedure XDMPLIB consists of the user's file (SAM, ISAM or VSAM) and a single control card. The control card is in a fixed format in that it must begin in card column 1 and parameters must be separated by commas. The control card is to be prepared as follows:

PRINT, PEPORT, XXXXXXX

where XXXXXXX will contain one of the following parameters:

- provides a listing of all report names and all logic statements.

LIST - provides a list of all report names

(Report ID) - provides a listing of all logic statement names for the report ID specified.

8.2 Job Setup

The following statements will assist to illustrate the job setup required to execute the XDMFLIB procedure:

```
// EXEC XDMPLIB, ISAM=TESTER
//UTCMP.SYSIN CD *
PRINT, FEPORT, ALL
/*
```

The preceding example will list all report and statement names on a cataloged ISAM data set named TESTER.

```
#// EXEC XDMPLIB, VSCAT='NIPS.CAT', ISAM='VSAM.TESTER'
//UTCMP.DATAFILE DD AMP='AMORG'
//UTDMP.SYSIN DD *
PRINT, REPORT, ALL
/*
```

* The preceding example will list all report and statement names on the VSAM file VSAM.TESTER cataloged on NIPS.CAT.

```
// EXEC YCMPLIB, ISAM=TESTER, VISAM="SER=FFSLIB"
//UTDMP.SYSIN DD *
PRINT, REPORT, REPTA
/*
```

This example will list associated logic statement names for a report entitled REPTA included in the uncataloged ISAM data set TESTER residing on a 2314 volume labeled FFSLIE.

```
// EXEC XDMPLIB, SAM=TESTER, VSAM='SER=N12345'
//UTCMF.SYSIN DD *
PRINT, REPORT, LIST
/*
```

The preceding example provides a listing of all report names contained within the data set TESTER which resides on a nine-track, 800 bpi tape with the volume serial number of N12345.

The XDMFIIB procedure may be executed in a separate job or as a step of, for example, an PM update. It is to be noted that all routines used in conjunction with the execution of this procedure reside on FFS. JOBLIE.

Section 9

UTCLASS

The program UTCLASS provides the user with the capability of changing the classification of a NIPS 360 FFS ISAM, SAM or VSAM file. A single card is required which will contain only the new classification of the file.

9.1 Input

The program UTCLASS requires a single input card containing the new classification of the data file. The card is free format and the new classification will be left-justified with trailing blanks, if required, when written out to the file. The length of the classification field is 32 characters and truncation will be performed to the right.

no classification of the file to blanks, that is, no classification, the input card must contain at least one blank enclosed in apostrophes. This is the only case in which an apostrophe which is entered on the input card does not become part of the actual file classification.

9.2 Output

rwo outputs are produced by a successful run of this program

- a. The updated data file containing the new classification.
- a. A listing on the printer indicating successful or unsuccessful updating and the new classification if successful.

//CIASS.SYSIN DD *
 (user-supplied card containing new classification)
/*

* The preceding example will change the classification of the VSAM file, VSAM.TESTER, cataloged on NIPS.CAT.

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9.3 Job Setup

The following statements illustrate the deck setup—used to execute the UTCLASS procedure.

```
// EXEC XCLASS, ISAM=TESTER,
// VISAM='SER=FFSLIE'
//CLASS.SYSIN DD *
```

(User-supplied card containing new classification)

/*

The preceding examples will charge the classification on an uncataloged ISAM file.

```
// EXEC XCLASS,SAM=TESTER,VSMOUT='SER=TSIVOL',
// SAMOUT=
```

(User-supplied card containing new classification)

/*

The preceding example will change the classification of a cataloged SAM file on tape.

```
// EXEC XCLASS, SAM=TESTER,
// USAM=2314, VSAM='SER=FFSLIB'
//CLASS.SYSIN DD *
```

(User-supplied card containing new classification)

/*

The preceding example will change the classification on an uncataloged SAM file on disk.

*// EXEC XCLASS, VSCAT= "NIPS. CAT", ISAM = "VSAM.TESTER"
//CLASS.DATAFILE DD AMF = "AMORG"

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CH - 3



Section 10

SCURCE LANGUAGE STORAGE

Source programs for NIPS components may be stored on a library to facilitate housekeeping and program maintenance. Maintaining a library will ensure that a single, current version of the source program is always available. The Source Program Library can be updated by batch jobs, or by the EDIT component if on-line terminals and the NIPS To component are available. EDIT capabilities are described volume VI of the NIPS User Manuals, Terminal Processing (TP).

10.1 Source Libraries

Two types of libraries can be utilized for storage. Both types are direct-access partitioned data sets. The first type of library is normally used to store 80-character card images. This library is similar to a Procedure or Macro Library and has fixed length, 80-character records, normally blocked to an efficient blocksize which is a multiple of 80.

The second type of library is the File Library. This library has records of undefined length and is normally used to store the compiled, executable NIPS user programs (Retrievals, RITs, etc.). Source programs will be stored outhis library in 800-character blocks, containing 10 card images each. OS utilities may not be used to modify source on this type of library, but NIPS components may as discussed below.

Each source program member stored on a library by a NIPS language component or utility will contain an indicator as to which NIPS language component (RASP, FM, etc.) is involved. This will enable a terminal user to scan a library for RITs, logic statements, etc.

Section 11

INDEX SPECIFIER (UTNDXSPC)

The Index Specification utility allows a user to specify indexing information for a data file without running a File Structure or File Maintenance job. The user can add and delete indexes in the same run. For each index added, all information necessary to make that index operational is generated and placed in the Index Data Set.

Any fixed-length field defined in the file may be specified as a secondary index. Any variable field, variable set or fixed-length alpha field defined in the file may be specified as a keyword index. A fixed-length field may not be specified as both a secondary and keyword index.

UTNDXSPC acts as the driver to perform the functions of calling Index Specification to insert or delete Index Descriptor Records in the data file, and of executing Index Maintenance to correlate the Index Descriptor Records in the data file with the Index Control Records in the Index Data Set and to update the latter accordingly. UTNDXSFC operates on an ISAM, SAM or VSAM data file.

11.1 UTNDXSPC Input

UTNDXSPC accepts SUB/TAB and INDEX statements as input. These statements must be submitted through the SYSIN device. Further discussion of Index Specification may be found in Volume II, File Structuring.

11.1.1 SUE/TAB Card

A SUB/TAB card is used to describe a subroutine cr table to be used by secondary indexing. A subroutine or table may be a conversion routine, to convert data from an internal data file format to a separate index format. On the other

hand, a subroutine or table may be an analyzer routine, designed to analyze the parameter list of a FUNCTION operator to determine index usage and provide a list of values for index qualification.

For a keyword indexed field, a subroutine or table defines options that direct the selection of keyword values. It may designate a stop word table which is a list of incelevant (noise) words, a dictionary which is a list of all non-literal keywords, or a user scan routine, which is a subroutine provided by the user to process the keyword indexed fields.

One SUB/TAB card must be submitted for each subroutine referred to by the INDEX statements. A subroutine or table may be defined for one function only in an Index Specification run, and each unique subroutine or table name may be submitted only once per run.

All SUB/TAB statements must appear first in the input stream, before the INDEX statements.

The SUB/TAE statement is free-format. The operands must be in order, each separated from the others by at least one blank. A period is used after the last entry to signify the end of the statement.

Operand.	<u>Meaning</u>
SUB SUBPOUTINE TAB TABLE	Statement identifier; may be any one of these.
5 ub n a me	Name of subroutine or table. This name must follow the conventions for system names as described in Volume 1, Introduction to File Concepts.

Table 1 - Name of Stop Word Table (optional)

Table 2 - Name of Dictionary (optional)

Sub 1 - Name of User Scan Routine (optional)

TEXT Hyphen Cpticn Default is TEXT

DROP RETAIN SEPARATE

TEXT - Always retain as part of text value.

DROP - Always drop from value. Superfluous if (1) text characters immediately precede and follow hyphen or (2) immediately preceded by a text character and followed by one or more blanks and a text character. If neither cf these cases apply, hyphen is treated as a word separator.

RETAIN - Same rules that apply to DROP, except that when the hyphen is not a word separator it is kept in the value as a text character.

SEPARATE - Hyphen is always treated as a word separator.

The delete operation requires only the first three operands - INDEX, the field name, and the action keyword, DELETE. For a secondary indexed field, the add operation requires only the first two operands -- INLEX and the field name -- but may optionally provide for a conversion and/or analyzer subroutine or table. In this case, the action parameter ADD must be present.

If only one subroutine or table is designated, its function - as a conversion subroutine or as an analyzer subroutine - will be determined from the parameters that are

specified in the SUE/TAB statement defining the subroutine. If both parameters are present, the first must be the conversion subroutine, and the second must be the analyzer subroutine. An analyzer subroutine or table may not be used as a conversion routine, and a conversion subroutine or table may not be used as an analyzer subroutine in the same Index Specification run.

For a keyword indexed field, the action parameter KEYWORD must be present after the ADD parameter in order to differentiate the two types of indexed fields. Any combination of stop word table, dictionary scan routine or hyphen option may be specified in any order.

Example of an Add Index Action:

INDEX MEQPT ADD CONSUB

Example of a Delete Index Action:

INDEX CHTRY DELETE

11.2 UTNDX32C Output

UTNDXSPC builds and inserts Index Descriptor Records into the data file for indexes added and deletes Index Descriptor Records for indexes deleted. It then calls Index Maintenance to either generate or update the Index Data Set. UTNDXSPC also lists a summary of actions performed plus any error conditions encountered.

11.3 UTNDXSPC Jcb Setup

The following JCL cards are used to invoke the cataloged procedure XSP which will either generate or update a diskresident Index Data Set based on the ISAM, SAM or VSAM data file.

//JOENAME JCB (Standard Parameters)
//STEPNAME EXEC XSP, PARM=GEN, ISAM=filename,
VISAM='SER=xxxxxx',

```
XVOL='SER=YYYYYY',

XDISP=(aaaa),

BLKS IZ R=zzzz,

NBRBLK=nnn,

XINDEX=indxname,

VSCAT=nipcat,

IAB=bb, DEN=c, VSMOUT='SER=dddddd', SAMOUT=samname

*//UTXSP.NEWFILE DD AMP='AMORG'
```

where:

PARM=GEN - Required only when creating an Index Data Set from a file already containing Index Descriptor records in the FFT.

#filename - Name of ISAM, SAM or VSAM data file.

volume serial number of the disk-resident ISAM data file or tape-resident SAM data file.

yyyyyy - Volume serial number of the disk-resident Index Data Set

aaaa - Required only when generating a new Index Data Set

zzzz - Blocksize, needed only when generating a new Index Data Set and cverriding the default size. Blocksize must be between 560 and 1020 bytes.

nnn - Number of blocks, needed only when generating a new Index Data Set and overriding the default size. A minimum of 50 blocks must be allocated.

indxname - Name of Index Data Set. It must be the same as the SAM or ISAM operand. The name will be suffixed with an X by the procedure.

The following parameters are required only when processing a SAM data base:

bb - Label processing

c - Tape processing

dddddd - Volume serial number of the output SAM data file

sammame - Name of output SAM data file. (Omitted in same as input file.)

The following parameter and the NEWFILE DD override statement are used only when processing a VSAM data file:

#nipcat - Name cf the NIPS user catalog for the VSAM data file.

Section 12

Index Transfer (UTNDXTFR)

An Index Data Set may reside on a direct-access device or on tape, but only the disk-resident medium can be used by any NIPS component. Index Transfer (UTNDXTFR) will permit the user to transfer the entire data set, from one resident medium to the other.

The primary use of UTNDXTFR is to reorganize the diskresident indexes. Initially, a disk-resident Index Data Set
is packed with index information. As the indexes are
maintained, gaps or unused areas may occur in the data set
as records are deleted and others are added. By using
UTNDXTFR, the user can transfer the disk-resident data (only
the valid information is transferred) to tape, and again
from tape back to disk. This operation condenses the data
set. The tape so created may be retained as a backup.

In the disk to tape mcde of operation, a statistical printout of unique values (for secondary indexed fields) and keywords (for keyword indexed fields) and their occurrences are optionally developed. Binary values will be converted to decimal for ease of reading. However, any dictionary fields using conversion subroutines or keyword fields having synonyms in the dictionary, will be printed in the converted form, just as they appear in the Index Data Set.

12.1 UTNDXTPR Input

Two cataloged procedures are available for invoking the UTNDXTFR utility. XTRDISK will transfer a disk-resident Index Data Set to a sequential access medium, while XTRTAPE will reconstruct an Index Data Set from a previously unloaded tape version of the disk data set.

12.2 UTNDXTFR Output

UTNDXTFR produces an Index Data Set on the residence medium indicated.

12.3 UTNDXTFR Job Setup

The following JCI cards are used to invoke the cataloged procedure XTRDISK which will unload a disk-resident Index Data Set to a sequential access medium:

```
//JO BNAME
             JOB
                      (Standard Parameters)
//STEPNAME EXEC
                     XTRDISK, XF NA ME = AAAAAAAA,
                     X FV CL = EBBBBB, X T N AM E = CCCCCCCC,
11
                     XTVOL=DDDDDDD,
11
11
                     STAT=YES, (optional)
                     ISAM = EEEEEEE, VISAM = FFFFFF
11
                     VSCAT = XXXXXXXXX
#//
                     SAM=GGGGGG, VSAM=HHHHHH
#//
#//XTR. DATAFILE DD AME= AMORG
```

where:

- AAAAAAA Name of the Index Data Set (the user must supply the "X" suffix)
- BBBBBB Volume serial rumber of the disk-resident Index Data Set
- Name of the unloaded version of the Index CCCCCCCC Data Set
- DDDDDDD Volume serial number of the sequential access device which will contain the unloaded Index Lata Set
- optional required only when the statics option (STAT=YES) is chosen. parameters
- *EEEEEEE Name of the ISAM or VSAM data file

FFFFFF - Volume serial number of the ISAM data file

GGGGGGG - Name of the SAM data file

HHHHHHHH - Volume serial number of the SAM data file

*XXXXXXX - Name of the NIPS user catalog for the VSAM data file.

The DATAFILE DD override statement is used only for processing VSAM data files.

The following JCL cards are used to invoke the cataloged procedure XTFTAPE which will reconstruct a disk-resident Index Data Set from a previously unloaded sequential version of the Index Data Set:

//JOBNAME JCE (Standard Parameters)
//STEPNAME EXEC XTRTAPE, XTNAME=AAAAAAAA,
XTVCL=BBBBEE, XFNAM F=CCCCCCCC,
XFVOL=DDDDDD

where:

AAAAAAA - Name of the disk-resident Index Data Set (user must supply the "X" suffix)

BBBBBB - Volume serial number of the disk-resident Index Data Set

CCCCCCCC - Name given to the unloaded version of the Index Data Set

DDDDDD - Volume serial number of the device containing the unloaded version of the Index Data Set

Section 13

UTFLDSCN

UTFLDSCN will scan the NIPS components source statements and provide the user with the count of data fields referenced in the source statements. This utility is useful in helping the analyst to determine the activity of his data fields. This will assist the user in determining which fields are candidates for index fields in the Secondary Indexing capability.

The utility will process source statements pertaining to a single file in one execution. Multifile RITs and multifile queries will be accepted as input; however, only the data fields of the input data file will be processed. All other files will be ignored. In order to completely process multi-file RITs and multifile queries, it would be necessary to include the source statements in an execution for each file referenced.

UTFLDSCN will output a listing of the scurce input statements followed by a listing of the count of references for the data fields and a summary listing of data field reference court for each batch component. A transaction record will also be output for each data field referenced in a single source input statement.

13.1 UTFICSCN Input

Input to the utility will consist of a NIPS data file in SAM, ISAM or VSAM format, a control card, and the source input statements and/or members of a partitioned data set.

The format of the input control card is as follows:

. / SOURCE COMP=XXXX, NAME=SNAME, MEMEER=MNAME

where ./ must be in cclumns 1 and 2 followed by one or blanks.

COMP=XXXX where XXXX may be FM, RASP, OP, or QUIP to identify the component.

NAME=SNAME where SNAME is the name of the source statement. If the source is a logic statement, the name must be the report name and logic statement names enclosed in quotes. If the report name is less than seven characters, it must be padded with blanks to seven characters.

MEMBER=MNAME where MNAME is the member name of the source statement on a partitioned data set. If this operand is used, a partitioned data set must be included in the job stream. If this operand is cmitted, the source statements must follow the control card in the input stream.

13.2 UTFLDSCN Output

The outputs from UTFLDSCN are as follows:

Source Listing - The source input records in input order.

Field Listing - This output will consist of a header for each source deck indicating file name, component name, source name, and member name, if any. The body of the listing will consist of only those fields referenced and the count of references. This will follow the source listing for each source module. After all source modules have been processed, a summary listing will be provided containing the count of the field references per component.

Data Set

Transaction - The transaction data set will be 50 characters long with an 'S' in cclumn one to be used as a logic statement name. The format is as follows:

Column 1 - CHARACTER 'S'

2-8 - FILE NAME

9-12 - COMPONENT NAME

13-25 - SOURCE MODULE NAME

26-33 - FIELD NAME

34-36 - SET NUMBER, DECIMAL

37-42 - COUNT OF REFERENCES, DECIMAL

43-48 - DATE - MMDDYY

49-50 - UNUSED

Parameters may be entered in the PARM field on the EXEC card to suppress output. They are as follows:

NS - Suppress printing of source input

NI - Suppress field and summary listing

NT - Suppress transaction output.

13.3 Job Setup

The utility will be executed by a procedure, XUTFSCAN. If the input statements are members of a partitioned data set, the data set must be included in the job stream. The following statements illustrate the job setup used to execute the XUTFSCAN procedure against the ISAM data file TEST360:

```
Utility Support (UT)
```

* The following JCL could be used to execute the XUTFSCAN procedure against the VSAM data file VSAM.TEST360:

Section 14

UTNDXKAN

UTNDXKAN provides the user with the capability to analyze the words in fields for which keyword indexing is to be specified. The results of the analysis can be used to determine the contents of stop word tables and dictionaries that are to be associated with those fields. If the system scan subroutine does not recover words as the user desires, a user-written scan subroutine can be used with this utility. All the words contained in a data base field can be displayed, or those words which are irrelevant (noise words) can be selected and compared to the words in the system stop word table. If that table is not adequate, the Dictionary Maintenance utility can be used to build a user stop word table. Then this utility is able to list all relevant (nonstop) words which can be used to determine dictionary requirements. If a dictionary is not employed, the words not in the stop word table will all appear as keyword entries in the index data set. Through dictionary application, synchomous words and words with varying suffixes can be collected under one Index Data Set entry, and the synchym cr suffixed form can still be used in a query statement. The Dictionary Maintenance utility can be used to build a dictionary so that this utility can produce a list of the words which will become Index Data Set entries together with the keywords (including synonyms and suffixed words) associated with them which can be used as query arguments.

UTNDXKAN processes either a SAM, an ISAM or a VSAM data file. The fields that are to be processed are specified by control statements. For each field specified, the utility obtains from the control statement or from the file itself the names of the scan subroutine, stop word table and dictionary required to process that field. It scans all values in the data base (unless the number of records to be processed has been limited by the user), optionally matches the recovered words to a stop word table, then optionally matches the remaining words to a dictionary. The actual

functions performed are controlled by accepting names to FFT entry specifications or by specifying BYPASS. Override names or BYPASS must be specified for all functions if the FFT entry does not indicate keyword indexing.

UTNDXKAN displays word lists with record frequency counts or, optionally, record identifications for each field processed or for all fields as a group. Frequency count reflects the number of NIPS records in which a word appears at least once.

14.1 Input

UTNDXKAN accepts FILE and FIELD control statements. FILE statement is optional. At least one field statement is required. Control statements are coded on cards or as card images and are contained in columns 1 through 71. Each statement must begin in a new record with the statement identifier FILE or FIELD in column 1 of that record. The file or field name shall immediately follow the statement identifier. A statement that exceeds 71 characters can be continued on one or more additional cards in columns 1 71. A nonblank character must be placed on column 72 to indicate continuation. A control statement can be interrupted after any comma or blank. Words may not be split between records. Column 72 of the last or only record of each control statement must be blank. Columns 73-80 of all records are ignored.

A control statement operand is made up of two or more keyword parameters. Each operand must be preceded and followed by one or more blanks or commas unless an operand terminates in column 71, in which case a continuation character (in column 72) may follow the operand. If multiple values are specified for an operand, at least one blank or comma must separate each value and the group of values must be enclosed in parentheses. The operands can be coded in any order. No extra commas are required to indicate omitted operands.

14.1.1 FILE Statement

The FILE statement may be omitted. It applies to file processing and affects all the fields to be processed. It may appear only once and must be the first statement. Its operands allow control of file access and output merging.

The statement identifier is:

FILE=filename - name of file. Must be coded in column 1.

The statement operands are:

MERGE=YES - merge the word lists from all fields into one group of lists that reflects the entire file.

BYPASS=one or more bypass options - valid only if MERGE=YES is specified. It defines the word lists to be suppressed for all fields and overrides the FIELD statement BYPASS operand. The display lists identified by the following terms are omitted from the output for all fields:

STCF - stcp word table matches

NONKEY - stcp word table and dictionary nonmatches

KEYWORD - dictionary matches including synonym sublists

SYNCNYM - keyword sublists

SUFFIXES - dictionary nonmatches which are composed of keywords with valid suffixes; the keywords appear in the keyword list.

SKIP=nnnnn - skip nnnnn NIPS logical records before processing any fields, where nnnnn is a number between 1 and 32767.

STOPAFT-nnnnn - stop after processing nnnnn NIFS logical records, where nnnnn is a number between 1 and 32767.

14.1.2 FIELD Statement

The FIELD statement identifies a field to be analyzed. At least one FIELD statement is required and up to 50 are allowed.

The statement identifier is:

FIELD=fieldname - name of field or variable set. Must be coded in column 1.

The statement operands are:

SCAN = name of scan subroutine - identifies the scan subroutine to be used instead of the FFT scan subroutine or the system scan subroutine.

STOP=name of stop word table or BYPASS - overrides the FFT stop word table specification or specifies BYPASS to cause the stcp word table match function to be omitted for this field in which case all recovered words are nonstop words.

DICT-name of dictionary or BYPASS - overrides the FFT dictionary specifications or specifies BYPASS to cause the dictionary match function to be omitted for this field, in which case all nonstop words are keywords.

HYPHEN=hyphen option - cverrides the FFT hyphen option specification. Valid options are TEXT, DROP, PETAIN and SEPARATE.

BYPASS=one or more bypass criticns - not applicable if BYPASS was specified on a FILE statement. It defines the word lists to be suppressed for the field. The display lists identified by the following terms are omitted from the output for the field:

STOF - stop word table matches

NONKEY - stcp word table and dictionary nonmatches

KEYWCBD - dictionary matches including synonym sublists

SYNONYM - keyword sublists

SUFFIXES - dictionary nonmatches which are composed of keywords with valid suffixes; the keywords appear in the keyword list.

FECID=YES - specifies that record identifications are to be shown in word lists instead of frequency counts.

14.2 Output

UTNDXKAN displays one list of words with either frequency counts or major record identifications for each field processed or for all fields as one group if the merge option is specified. A two-character code associated with each word identifies its type. Words from types for which bypass is specified are omitted from the list. If a dictionary was specified and a data word matched a convert synonym or was suffixed, the dictionary word which will be substituted for the data word is inserted after the data word at an offset.

14.3 Job Setup

The following JCL statements illustrate the deck setup used to invoke the XKA cataloged procedure for a cataloged ISAM file and a cataloged user library:

// EXEC XKA, ISAM=filen ame, LIB=libname
//XKA.SYSIN DD *
 (user-supplied control statements)
/*

where

- filename name of the NIPS ISAM data file
- libname name of library containing user scan subroutines, stop word tables and dictionaries.

The following JCL statements illustrate the deck setup used to invoke the XKA cataloged procedure for an uncataloged SAM file and an uncataloged user library:

where

- filename name of the NIPS SAM data file
- aaaaaa serial number of the SAM data file
- libname name of the library containing user scan subroutines, stop word tables, and dictionaries
- ttbbbb serial number of the user library.
- * The following JCL statements illustrate the deck setup used to invoke the XKA cataloged procedure for a VSAM data file cataloged on a NIPS user catalog:

where:

- # nipcat name of NIPS user catalog for the VSAM data file
- # filename name of the NIPS VSAM data file
- # libname name of the library containing user scan subroutines, stop word tables, and dictionaries.

Section 16

Format Definition Translator Utility (UTODE)

UTODE is used to place format definitions on a user library. A format definition gives a description of a CRT display format and the Input Message Queue records to be created from data entered on the display. Before a user can call for the display format at a CRT terminal, the format definition must reside on the user library. UTOTE creates skeleton and IMQ table control blocks from the format definition source statements and writes the control blocks into the user library using the display format name as the member name.

16.1 Input

Input to UTCDE will consist of one or more format definitions. The format definition source statements are described in Section 6 (FORMATTER) of the Terminal Processing Users Manual. The input source statements may be in punched cards or in card image records stored in a partitioned data set.

16.2 Job Setup

The following JCL statements illustrate the čeck setup used to execute UTODE. In the first setup, the input definition source statements are in punched cards.

//AA EXEC XUTCDE,LIB=TEST360,VLIE='SER=MYPACK'
//SYSIN DD *

Definition source statement cards.

/*

The following JCL would be used if the input were card image records stored in a library.

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```
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```

```
//AB EXEC XUTODE, LIB=TEST360, VLIB= SER = MYPACK //SYSIN DD DSN=MYLIB (FORMAT1), VCL=SER=MYPACK2,

DISP=(SHR, KEEP), UNIT=2314,

DCB=(RECFB=FB, LRECL=80, BLKSIZE=800)
```

Management entres " . .